

Coastal acidification affects us all; monitoring helps us understand how to best respond

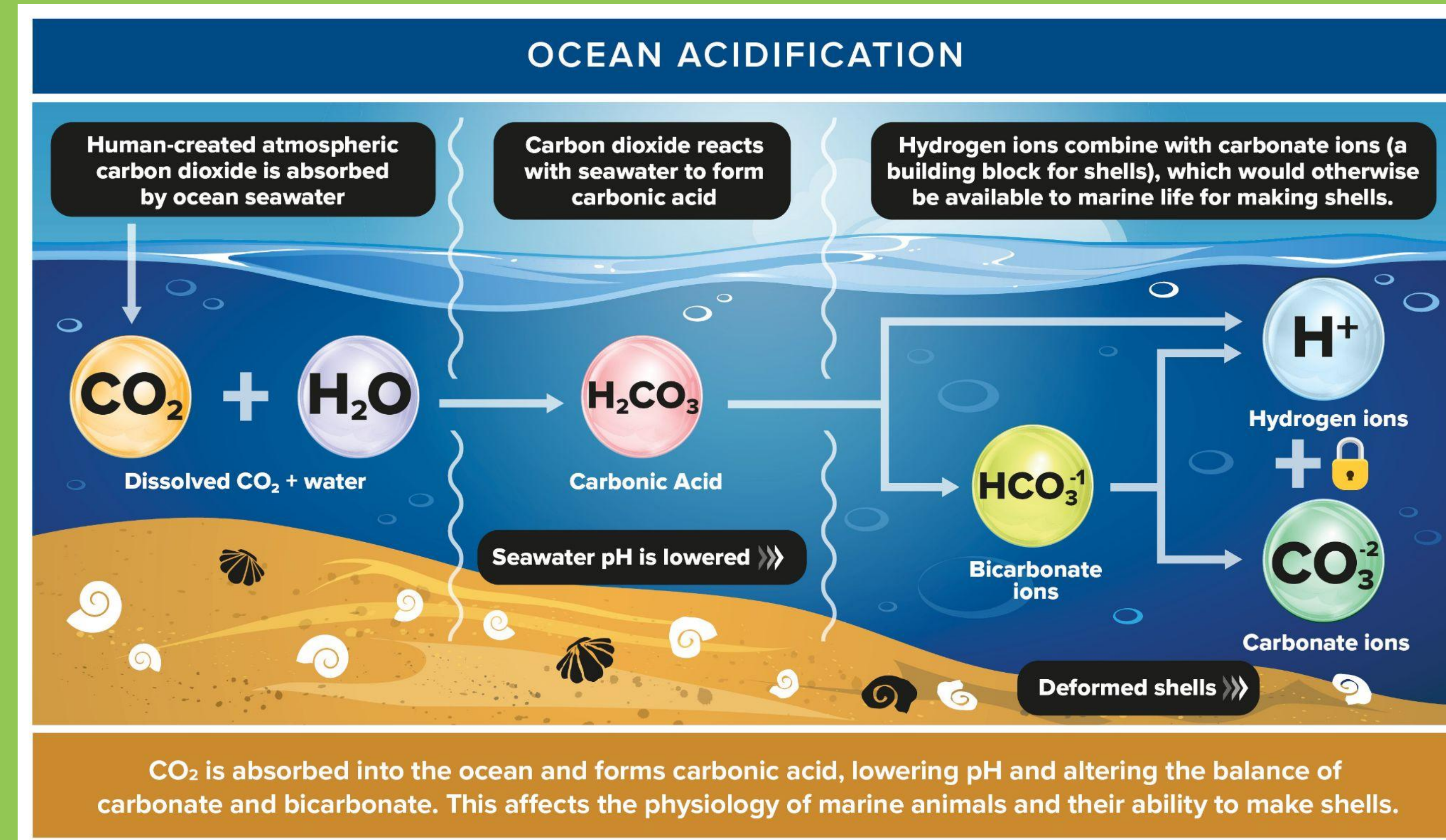
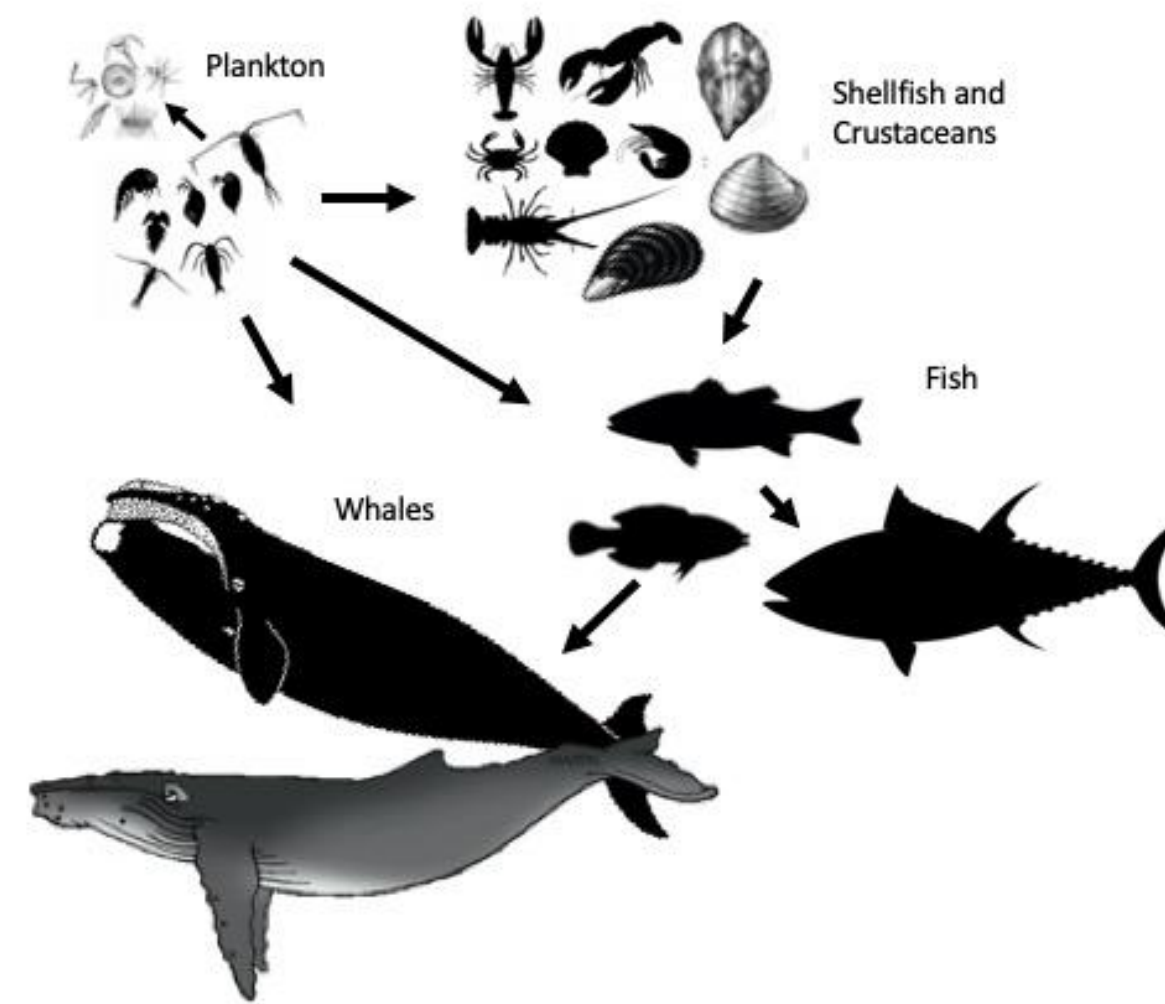


Diagram: College of Biological Sciences - UC Davis

Acidification of coastal waters impacts the entire food web by interfering with growth, reproduction, metabolism, and survival. Some species like shellfish are directly affected. Other species are indirectly affected because they eat or live in habitats created by directly impacted species.



Because acidification is reducing the availability of carbonate ions, animals that form shells, such as oysters and clams are some of the most vulnerable species.

Shellfishing is a way of life on Cape Cod

On Cape Cod, there are 265 shellfish growers working on more than 660 acres of habitat. In 2018 they harvested:

- > 26 million Oysters valued at > \$14.5M
- > 3.7 million Quahogs valued at about \$1M... and are increasing each year.



Why it Matters

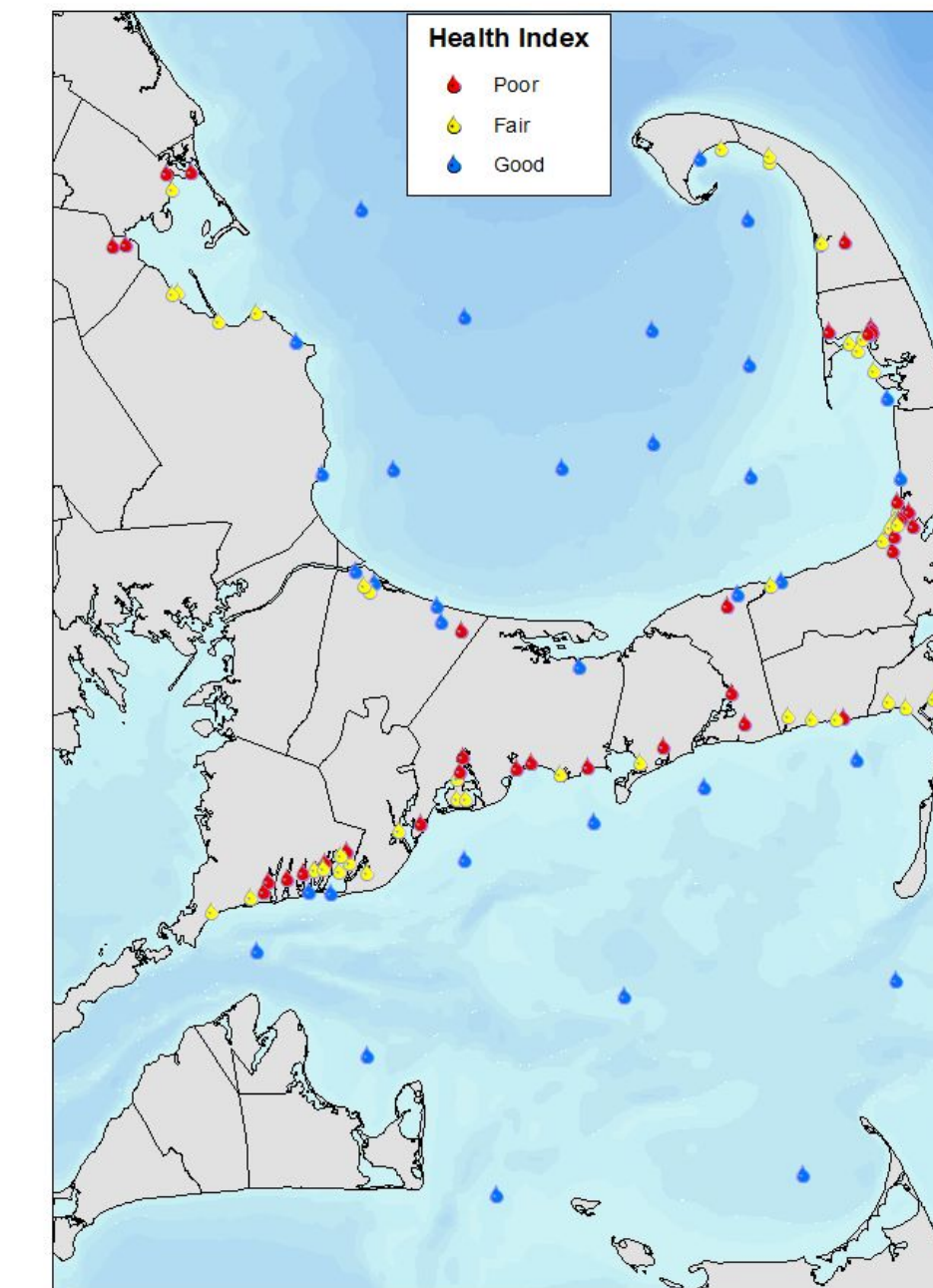
- **Ecology:** Many marine species and ecosystems are threatened by the rapidly increasing acidity of our coastal waters.
- **Economy:** The shellfish industry in the U.S. is predicted to lose more than \$400 million annually by 2100 as a result of ocean acidification.

What You Can Do

Although our actions have accelerated ocean acidification, there are things we can do to slow down the process both individually, and through supporting legislation, for example by:

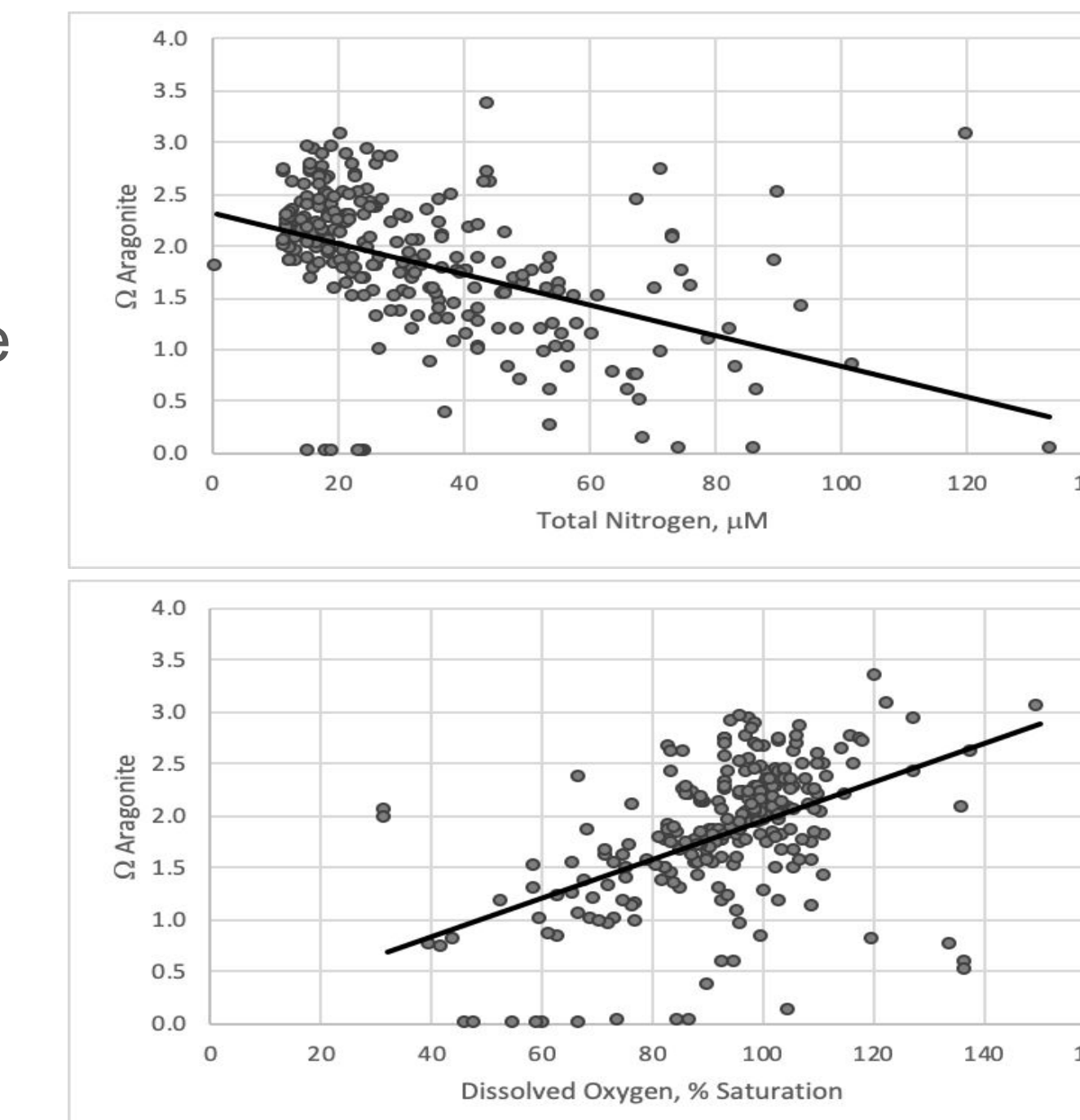
- Using and creating energy more efficiently so less CO_2 is emitted into the atmosphere.
- Reducing nutrient pollution to our coastal waters.
- Protecting marine habitats and wildlife so that the ocean is more resilient.
- Supporting research and monitoring efforts addressing ocean acidification.

With funding from Mass Bays, the Center for Coastal Studies added acidification monitoring into its long-term water quality monitoring program, which includes sites around the Cape and Islands.

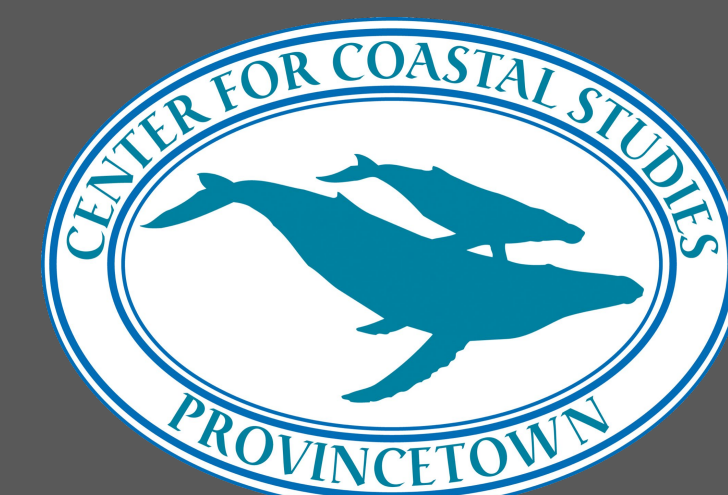


Eutrophication is the process by which a body of water becomes enriched in nutrients, especially phosphates and nitrates, that promote excessive algae growth, leading to increased organic material and decreased oxygen.

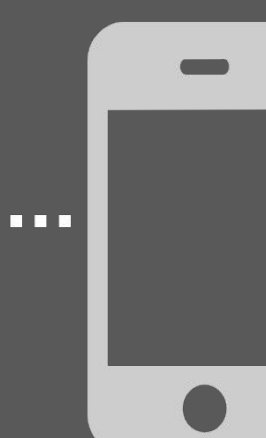
Eutrophication contributes to **coastal acidification** and is impacting shellfish, but how much? Our monitoring will help us understand where to take action.



Increased nitrogen levels and decreased oxygen concentrations, both indicators of eutrophication, are correlated with decreased availability of calcium carbonate (Ω aragonite) which makes it harder for shellfish to form shells.



Center for Coastal Studies



Take a picture to see more data from Cape Cod



This work supported by